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| APPLICATION NO.                        | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/754,565                             | 01/12/2004  | Chandra Mouli        | M4065.0997/P997     | 8237             |
| 24998                                  | 7590        | 06/07/2006           | EXAMINER            |                  |
| DICKSTEIN SHAPIRO MORIN & OSHINSKY LLP |             |                      | LOKE, STEVEN HO YIN |                  |
| 2101 L Street, NW                      |             |                      | ART UNIT            |                  |
| Washington, DC 20037                   |             |                      | PAPER NUMBER        |                  |
|  |             |                      | 2811                |                  |

DATE MAILED: 06/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

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|                              |                 |                |  |
|------------------------------|-----------------|----------------|--|
| <b>Office Action Summary</b> | Application No. | Applicant(s)   |  |
|                              | 10/754,565      | MOULI, CHANDRA |  |
|                              | Examiner        | Art Unit       |  |
|                              | Steven Loke     | 2811           |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 January 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-4, 6, 7, 9, 10, 14-24, 29-40, 42 and 67-72 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 39, 40 and 42 is/are allowed.
- 6) ☒ Claim(s) 1, 4 and 22-24 is/are rejected.
- 7) ☒ Claim(s) 2, 3, 6, 7, 9, 10, 14-21, 29-38 and 67-72 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 January 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>10/31/05</u> .  | 6) <input type="checkbox"/> Other: _____                                    |

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1. Claims 1-4, 6, 7, 9, 10, 14-24, 29-38 and 67-72 are objected to because of the following informalities: Claim 1, line 12, claim 16, lines 14-15, claim 21, line 4, claim 30, line 13, claim 36, line 4, the phrase "aluminum silicates" is unclear whether it is being referred to "aluminum silicate". Claim 3, lines 3-4, the phrase "wherein said isolation region has a bottom and sidewalls at least said sidewalls having..." is not grammatical correct. There should be a "," after the word "sidewalls". Claims 70-72, line 1, the phrase "The pixel cell" has no antecedent basis. Claims 70-72, line 1, the phrase "said first layer" has no antecedent basis. Appropriate correction is required.

2. Applicant is advised that should claim 1 be found allowable (when the material of claim 1 is aluminum oxide), claim 4 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

3. Applicant is advised that should claim 1 be found allowable (when the material of claim 1 is aluminum nitride), claim 6 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

4. Applicant is advised that should claim 1 be found allowable (when the material of claim 1 is aluminum silicate), claim 7 will be objected to under 37 CFR 1.75 as being a

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substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

5. Claims 22-24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 22, lines 1-3, the phrase "said isolation trench is filled with a high-k dielectric material having an excess negative charge" is vague and indefinite. Claim 17, the great grandparent claim of claim 22, discloses the sidewalls of said isolation trench comprise a second material layer of high-k dielectric material (the embodiment of fig. 10a) while claim 22 discloses said isolation trench is filled with a high-k dielectric material having an excess negative charge (the embodiment of fig. 10b or 10c). It is believed that claim 22 should not depend to claim 17 because claim 17 and claim 22 are directed to different embodiments of the invention.

Claim 23, lines 1-4, the phrase "said sidewalls and said surface of said substrate further comprise a layer of dielectric material between said first and second material layers and said substrate" is unclear whether it is being referred to "said sidewalls and said surface of said substrate further comprise a layer of dielectric material between each of said first and second material layers and said substrate".

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Prince et al.

In regards to claims 1 and 4, Prince et al. disclose a pixel cell [72] in fig. 4. It comprising: a substrate [74]; and a photosensor [72] in said substrate [74].

Fig. 4 of Prince et al. differ from the claimed invention by not showing said photosensor including a first conductivity area below a surface of said substrate and a second conductivity area at least between said first conductivity area and said substrate surface; and a first material layer having an excess charge sufficient to create an electric field that affects said second conductivity area, wherein said first material layer is located above said surface of said substrate, at least over said photosensor and comprises a material selected from the group consisting of aluminum oxide, aluminum nitrides and aluminum silicates.

Fig. 1 of Prince et al. discloses a photosensor including a first conductivity (p-type) area [32] below a surface of said substrate [30, 32] and a second conductivity (n-type) area [40] at least between said first conductivity area [32] and said substrate surface; and a first material layer [46] (aluminum oxide) inherently having an excess charge sufficient to create an electric field that affects said second conductivity area [40] (It is well known in the art that aluminum oxide having fixed (negative) charges (See the 7<sup>th</sup> paragraph in page 525 of Sazonov et al.), wherein said first material layer [46] (claims 1

and 4 of Prince et al.) is located above said surface of said substrate [30, 32], at least over said photosensor and comprises a material made of aluminum oxide.

Since figs. 4 and 1 of Prince et al. disclose a photodiode formed in a semiconductor substrate, it would have been obvious to have the photodiode structure of fig. 1 of Prince et al. in fig. 4 of Prince et al. because it can reduce the amount of unwanted radiation (optical noise) by a factor of more than a million.

8. Claims 16 and 30 would be allowable if rewritten or amended to overcome the objection set forth in this Office action.

9. Claims 39, 40 and 42 are allowed.

10. Claims 2, 3, 6, 7, 9, 10, 14 and 15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11. Applicant's arguments with respect to claims 1, 4 and 22-24 have been considered but are moot in view of the new ground(s) of rejection.

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

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shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven Loke whose telephone number is (571) 272-1657. The examiner can normally be reached on 8:00 am to 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on (571) 272-1732. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

sl  
May 26, 2006

*Steven Loke*  
*Primary Examiner*  
